Fisheries & Wildlife Management Division

RESOURCE STATUS AND ASSESSMENT BRANCH

Status of the Short-eared Owl (Asio flammeus) in Alberta

Kort M. Clayton

Alberta Wildlife Status Report No. 28

Alberta Conservation Association

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PREFACE

Every five years, the Fisheries and Wildlife Management Division of Alberta Natural Resources Service reviews the status of wildlife species in Alberta. These overviews, which have been conducted in 1991 and 1996, assign individual species to 'colour' lists that reflect the perceived level of risk to populations that occur in the province. Such designations are determined from extensive consultations with professional and amateur biologists, and from a variety of readily available sources of population data. A primary objective of these reviews is to identify species that may be considered for more detailed status determinations.

The Alberta Wildlife Status Report Series is an extension of the 1996 *Status of Alberta Wildlife* review process, and provides comprehensive current summaries of the biological status of selected wildlife species in Alberta. Priority is given to species that are potentially at risk in the province (Red or Blue listed), that are of uncertain status (Status Undetermined), or which are considered to be at risk at a national level by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Reports in this series are published and distributed by the Alberta Conservation Association and the Fisheries and Wildlife Management Division of Alberta Environment, and are intended to provide detailed and up-to-date information which will be useful to resource professionals for managing populations of species and their habitats in the province. The reports are also designed to provide current information which will assist the Alberta Endangered Species Conservation Committee to identify species that may be formally designated as endangered or threatened under the Alberta Wildlife Act. To achieve these goals, the reports have been authored and/or reviewed by individuals with unique local expertise in the biology and management of each species.

EXECUTIVE SUMMARY

The Short-eared Owl (Asio flammeus) is currently on the 'Blue List' of species that may be at risk in Alberta. The Short-eared Owl occurs throughout the non-mountainous regions of Alberta and is most often associated with open habitats including grasslands, marshes, peat-lands, and clear-cuts.

The Short-eared Owl occurs on every continent except Antarctica and Australia. In North America, this owl nests throughout the northern parts of the continent and migrates as far south as Mexico and the West Indies. The Short-eared Owl is very nomadic and responds irruptively on a broad geographic scale to high concentrations of small mammals. Microtus voles typically dominate the diet of this owl. The nomadic habits of the Short-eared Owl make population trends and range delineation difficult to assess. Population declines in the northeastern United States and across Canada have caused concern for the survival of this species.

This report summarizes information on the Short-eared Owl as a step in updating its status in the province.

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INTRODUCTION

The Short-eared Owl (Asio flammeus) is a highly nomadic species that occurs throughout much of the world. This owl responds irruptively, on a broad geographic scale to high concentrations of small mammals. Consequently, the migrations and population status of the Short-eared Owl in North America are poorly understood. Populations have declined dramatically in the northeastern U.S. and there is evidence of significant long-term declines elsewhere. Concern over population declines and a lack of information on this species in Alberta have led to its inclusion on the 'Blue List*' of species that may be at risk in the province (Alberta Wildlife Management Division 1996).

This report summarizes current and historical information on the Short-eared Owl in Alberta in an effort to update its status in the province.

HABITAT

The Short-eared Owl is typically associated with open areas that support cyclic small mammal populations (e.g., voles or lemmings; Holt and Leasure 1993). Habitats used throughout the circumpolar range of this species include arctic tundra (Johnsgard 1988), clear-cuts (Sonerud 1986), peat lands (Mikkola 1983), fresh and saltwater marshes (Holt and Leasure 1993), grasslands (Clark 1975), cropland (Houston 1997), and shrub-steppe (Lehman et al. 1998). In Alberta, the Short-eared Owl is most often reported in the Grassland and Aspen Parkland Natural Regions (Semenchuk 1992, Strong and Leggat 1992).

The Short-eared Owl is one of the few species of North American owls that routinely nest on the ground. Among 63 nest sites reported by Clark (1975) from Saskatchewan, 55% were in grassland, 24% in grain stubble, 14% in hayland, and 6% in shrubs (e.g., buckbrush, Symphoricarpos occidentalis). Clark (1975) also described one nest built on a hummock in a burned peat bog in a lush growth of bulrush (Scirpus spp.). Clark (1975) suggests a definite tendency for the species to build nests on drier ground locations, especially relative to sites used by Northern Harriers (Circus cyaneus). During 50 years of banding in south central Saskatchewan, Houston (1997) reported Short-eared Owl nests to be "heavily concentrated in open stubble". In Montana, 85% of Short-eared Owl nests were predominantly surrounded by grasses, 8% by herbs, and 7% by herb/grass (Holt and Leasure 1993). Ninety percent of vegetation around these nests was <0.5 m tall, 9% was 0.5-1.0 m, and 1% was >1.0 m. Holt (1992) also reported vegetation around nests in Massachusetts ranging from 35-53 cm. In southeastern Illinois, most nests were in mowed fields of non-native grasses approximately 30-40 cm in height (Herkert et al. 1999).

The irruptive nesting habit of the Short-eared Owl complicates assessment of available breeding habitat in Alberta. Prey availability is usually the proximate factor that determines breeding locales. For example, the extensive mixed-grass prairie region of the Special Areas in southeastern Alberta appears to be suitable habitat for nesting Short-eared Owls (K. Clayton, unpubl. data). However, J. K. Schmutz observed relatively few Short-eared Owls (<1/yr) in this region during raptor studies conducted from 1984 to 1996. In 1997, however, roadside raptor counts conducted within the Special Areas in June and July yielded 15 Short-eared Owls along 192 km of gravel and unimproved dirt roads (1 owl/12.8 km; K. Clayton, unpubl. data). Small mammal trapping in the summer of 1997 resulted in 2.6 voles/100 trap nights, including Meadow Voles (Microtus pennyslvanicus) and Prairie Voles (Microtus ochrogaster; Clayton 1998). By comparison, in the autumn of 1996 when Short-eared Owls were

* See Appendix 1 for definitions of selected status designations

not regularly observed in the region, the capture rate for voles was 0.3/100 trap nights.

Few studies have specifically addressed foraging habitat of the Short-eared Owl. Martinez et al. (1998) reported that throughout the year, Short-eared Owls in an agricultural landscape in southern Chile concentrated their hunting along roadsides, in ungrazed meadows, and untilled lands. Unfortunately, this study did not employ radio-telemetry and habitat preferences were not tested statistically (e.g., use vs. availability).

Winter roosts provide shelter from the weather and are usually close to hunting areas (Clark 1975). Communal winter roosts in southeastern Illinois were primarily on the ground among grasses mowed to 30-40 cm (Walk 1998). Average visual obstruction height from Short-eared Owl roosts was significantly lower than that recorded for Northern Harrier roosts. Weller et al. (1955) reported Short-eared Owl roosts in dense grass <30 cm high in Missouri. Clark (1975) found Short-eared Owls roosting in pine (Pinus spp.) and juniper (Juniperus spp.) groves in New York.

CONSERVATION BIOLOGY

The Short-eared Owl is so named because of the short, inconspicuous ear tufts on top of its head. The plumage varies from light brownish-orange to buffy white, with a whitish facial disk, darkly ringed eyes, and a dark wrist patch on the underwing. The specific name, flammeus, refers to the rusty or 'flame colored' plumage. Adults of both sexes are very similar, but the males are generally paler (Johnsgard 1988). This is a medium sized owl with males averaging 315 g and females 378 g (Earhart and Johnson 1970).

The Short-eared Owl is considered a loosely colonial breeder (Holt and Leasure 1993). Communal winter roosts sometimes become breeding colonies in spring, likely as a facultative response to a food resource (Holt and Leasure 1993). Courtship begins in late winter when males perform 'sky dancing' displays consisting of shallow aerial stoops, wing clapping, and a courtship song (Holt and Leasure 1993). Although Short-eared Owls often overwinter in Alberta, the first spring migrants arrive during March and early April (Pinel et al. 1993). The female scrapes out a nest bowl on the ground and lines it with grasses (Clark 1975). Egg dates reported from Manitoba and Alberta range from 5 May to 20 June (Bent 1938). Murray (1976) reported mean clutch size for nests in North America as 5.6 with a range of 1-11. Clutch size also increases significantly with latitude (Murray 1976); clutches from Manitoba averaged 8.6 eggs (Clark 1975). Eggs are laid at one to two day intervals and are incubated by the female for 24 to 29 days (Holt and Leasure 1993). Brooding is also performed only by the female (Clark 1975). Young Short-eared Owls develop very rapidly leaving the nest when 14 days old and wandering up to 200 m away before fledging at 28 to 35 days (Clark 1975, Holt 1992).

Small mammals, particularly Microtus, dominate the Short-eared Owl's diet in North America. In seven of nine studies from Canada and the United States, mammals constituted >95% of prey items (Holt 1993). Meadow Voles were the predominant species in most studies, ranging from 78 to 97% of items. However, Clark (1975) suggested that Short-eared Owls do not actively seek out Meadow Voles, but take whatever prey is most available to them. Voles are often the most available to owls because of their shared affinity for open grassland habitats and because both are most active during the crepuscular hours. The extreme peaks that vole populations exhibit also make them a very attractive resource. In other North American studies where Meadow Voles were not abundant or available, other rodents predominated the Short-eared Owls' diet, including: Deer Mouse (Peromyscus maniculatus; Munyer 1966), California Vole (Microtus californicus; Johnston 1956, Page and Whitacre

1975), Hispid Cotton Rat (Sigmodon hispidus) and Least Shrew (Cryptotis parva; Hogan et al. 1996). Different small mammals dominate the Short-eared Owl's diet on other continents: in southern Chile, Olivaceous Field-mice (Akodon olivaceus) and Norway Rats (Rattus norvegicus; Martinez et al. 1998); and in Europe, Orkney Vole (Microtus arvalis orcadensis; Gorman and Reynolds 1993), Field Vole (Microtus agrestis), and Common Vole (Microtus epiroticus; Korpimäki and Nordahl 1991).

Several studies have documented a high correlation between Short-eared Owl abundance and peaks in vole population cycles (see 'Habitat' section, above for example from Alberta). In northern Europe, Short-eared Owl populations respond numerically (Korpimäki and Norrdahl 1991) and synchronously (Korpimäki 1994) to fluctuations in vole density. Poulin et al. (in prep.) also noted an immediate increase in Short-eared Owls in response to a vole peak in southern Saskatchewan in 1997.

Clark (1975) gives a detailed description of Short-eared Owl hunting behaviour. They hunt primarily on the wing, coursing less than 3 m above the vegetation. They also hover at higher altitudes (up to 30 m), essentially holding their position in the wind with limited wing movement. Less frequently, Short-eared Owls hunt from perches. Most hunting is done at night, but diurnal hunting may be required when adequate prey cannot be captured at night. Bosakowski (1989) documented evening and nocturnal hunting by wintering Short-eared Owls, but few daytime observations. Short-eared Owls are often observed during crepuscular hours (i.e., at dawn and dusk).

DISTRIBUTION

1. Alberta. - Short-eared Owls occur throughout the non-mountainous regions of Alberta (Figure 1). Reliable sources depict Short-eared Owls occurring throughout the province (Salt and Salt 1976, Johnsgard 1988, Holt and Leasure 1993), however, observation records suggest the northern limit of breeding in Alberta to be Peace River, Lesser Slave Lake, and Cold Lake (Semenchuk 1992). The paucity of observations from the northern portion of the province is likely the result of insufficient sampling (Figure 1). Short-eared Owls have been reported nesting in boreal regions north of Edmonton (Semenchuk 1992) and in boreal and arctic landscapes further north in Alaska and the Northwest Territories (Holt and Leasure 1993). Therefore, it is likely that Short-eared Owls nest, at least irregularly, throughout northern Alberta.

It is difficult to define the wintering distribution of this nomadic species. Johnsgard (1988) describes Short-eared Owls as variably migratory throughout North America with only the northern most populations being consistently migratory. Most range maps depict Alberta as beyond the northern wintering limit for Short-eared Owls (including Figure 2). However, there are numerous winter records of this species near Calgary, Edmonton, and Grand Prairie (e.g., Sadler and Myres 1976, Pinel et al. 1993).

2. Other Areas. - The Short-eared Owl is one of the world's most widely distributed owls, occurring on every continent except Antarctica and Australia. In North America, Short-eared Owls nest throughout the northern parts of the continent and migrate as far south as Mexico and the West Indies (Hoffman et al. 1999; Figure 2). However, the nomadic habits of this species often result in observations outside the suggested seasonal ranges. Short-eared Owls breed throughout South America, Europe, Asia, and on a variety of islands outside these continents. Outside North America, Short-eared Owls winter as far south as northern Africa and Indonesia. There is no information as to whether the Short-eared Owl has experienced any changes in range in North America or elsewhere.

Figure 1. Year-round observations of the Short-eared Owl in Alberta, 1964-1999. Data are from the Atlas of Breeding Birds of Alberta (Semenchuk 1992) and the Biodiversity/Species Observation Database maintained by Alberta Conservation Association and Alberta Environment.

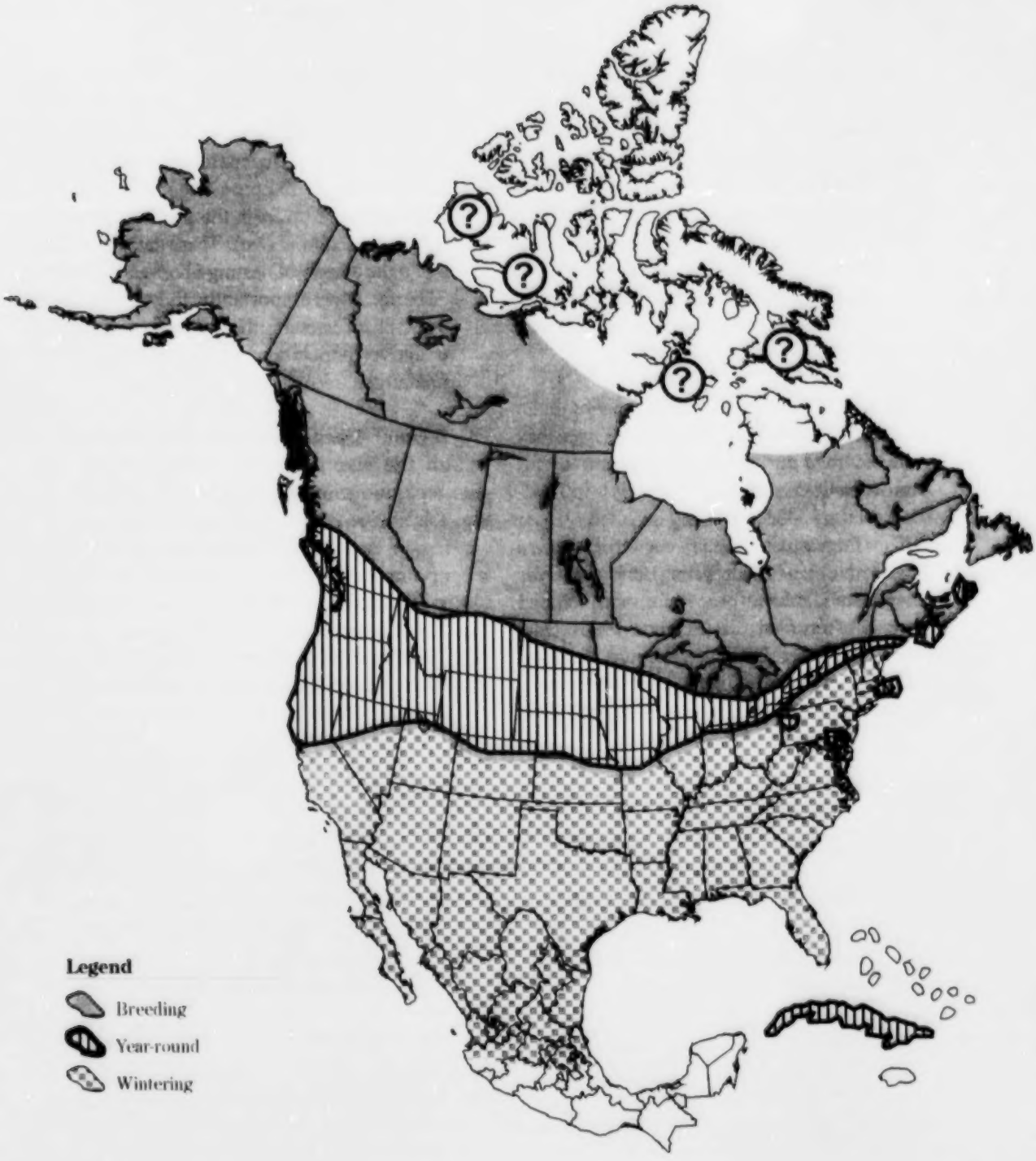

Figure 2. Distribution of the Short-eared Owl in North America showing the 'typical' breeding, year-round and wintering ranges (adapted from Holt and Leasure 1993). Occurrence of the species within this range is patchy and exceptions to seasonal limits are not uncommon.

POPULATION SIZE AND TRENDS

1. Alberta. - There are no current population estimates for the Short-eared Owl in Alberta. Breeding Bird Survey (BBS) data suggest a long-term, although non-significant, decline of this species in the province (Table 1; Figure 3). Semenchuk (1992) reported Short-eared Owls to be "fairly common in the Grassland and Parkland regions, and uncommon in the Boreal Forest region" of Alberta.

Although specific surveys have not been conducted in Alberta for Short-eared Owls, they were recorded during an extensive survey for Burrowing Owls (Athene cunicularia). In 1994-95, a total of 3431 randomly selected quarter sections from across the prairie region of southern Alberta were searched for nesting Burrowing Owls using a standardized procedure that included playback of recorded calls (Schmutz 1996). Only eight Short-eared Owls were recorded during these surveys. In 1997 and 1998, 109 quarter sections (from the original 3431) in the Hanna region were surveyed yielding 15 Short-eared Owls in 1997, and only one in 1998 (T. I. Wellicome, unpubl. data). Short-eared Owls were unusually common in the Hanna area in 1997 and small mammal trapping suggested that vole numbers were up from the previous year (see 'Habitat' section, above). These data reveal little about the density of nesting Short-eared Owls in Alberta. More importantly, they illustrate the difficulty of assessing the status of a nomadic and irruptive 'population' of highly mobile avian predators.

2. Other Areas. - Little information is available on the size or trend of Short-eared Owl populations in other parts of North America. Tate's (1986) 'Blue List' of seven North American regions reported this species to be "greatly down in numbers" in the prairie provinces, central southern, and middle Pacific Coast regions and "down in numbers" in the Hudson-Delaware, Ontario, middle-western prairie, and southern Great Plains regions. Marti and Marks (1989) reported Short-eared Owls as "common and

Table 1. Long-term trends in North American Short-eared Owl populations based on Breeding Bird Survey (BBS) and Christmas Bird Count (CBC) data. Results presented are from Downes et al. (1999) and Sauer et al. (1996,1999), and were analyzed using route regression analysis (Geissler and Sauer 1990).

Data Set	Survey Range	% Change(1)	N(2)	P
BBS				
Canada-wide(3)	1966-96	-12.7	28	0.05<P<0.15
Alberta(3)	1966-96	-9.6	18	not significant
Manitoba(4)	1966-98	-39.5	6	0.15
Saskatchewan(4)	1966-98	-28.0	6	0.10
Canadian prairies(3)	1966-96	-10.5	21	not significant
United States(4)	1966-98	0.3	109	0.87
Western BBS Region(4)	1966-98	-7.7	74	0.08
CBC				
North America(5)	1966-88	-1.8	958	<0.01

(1) % Change = mean annual percent change
(2) N = number of routes (BBS) or circles (CBC) used in analysis
(3) Downes et al. (1999)
(4) Sauer et al. (1999)
(5) Sauer et al. (1996)

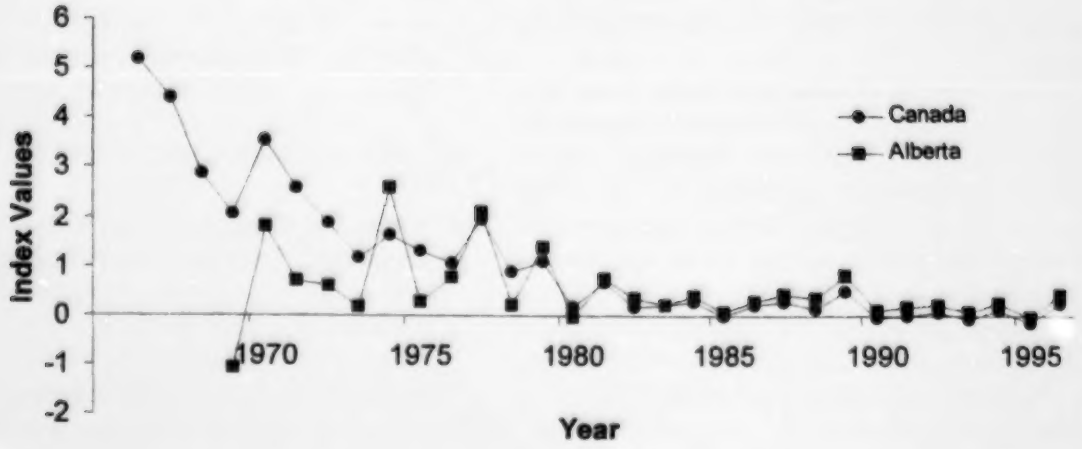

Figure 3. Index of population change of the Short-eared Owl in Alberta and Canada, 1966-1996. Data are from the North American Breeding Bird Survey (Downes et al. 1999).

stable" to "fluctuating" in eight western states, and "rare and decreasing" in California.

As a nomadic species capable of long distance movements between years, Short-eared Owl populations cannot be monitored adequately with local surveys, even at the state or provincial level. Short of an intensive, annual, continental survey, the BBS and CBC currently provide the best means of tracking Short-eared Owl populations in North America. Despite the biases associated with BBS and CBC data, these extensive surveys provide a coarse index of population trends.

Short-eared Owl abundance has declined significantly on BBS routes across Canada (Table 1; Figure 3). Declines also occurred in the Canadian prairies, and throughout the western BBS region that includes many western states and provinces. However, these declines were not statistically significant. Although BBS data do not reflect it, the most serious decline in Short-eared Owl populations is believed to have occurred in the northeastern United States (Tate 1992, Holt and Leasure 1993). Thirty years of CBC data from across North America revealed a significant 1.8% annual decline in abundance.

LIMITING FACTORS

Factors that limit the population of Short-eared Owls include those that reduce either reproductive success or survival. Unfortunately, controlled studies have not been conducted to delineate critical conservation needs of Short-eared Owls.

1. Habitat Loss and Degradation. - Loss and degradation of habitat through agriculture, grazing, recreation, or development has been implicated in Short-eared Owl declines in some areas. In central California, where numbers are said to be "greatly down" (Tate 1986), Short-eared Owls nest primarily in marshland that is being lost to agriculture and urbanization (Marti and Marks 1989). Similarly, the urbanization of coastal grasslands in Massachusetts has contributed to considerable declines (Holt 1985). As with any ground nesting bird, the removal of dense ground cover renders nesting Short-eared Owls vulnerable to mammalian predators. Marks and Marti

(1989) suggested that overgrazing of rangelands has been detrimental to western U.S. populations.

2. Food Abundance. - More than any single factor, reproduction and survival of Short-eared Owls is clearly tied to small mammal abundance. In the Canadian prairies, the Meadow Vole appears to be the predictive resource. Meadow Vole populations are characterized by two- to five-year cyclic fluctuations in density (Reich 1981). The amplitude of such cycles is influenced by many factors (e.g., climate, food quality, predators, physiological stress, etc.).

The mechanisms and geographic extent of vole peaks are not well documented. In the two years that Houston (1997) noted high vole densities and large numbers of Short-eared Owl nests in Saskatchewan, winter had come early and snow had covered the unharvested swathes of grain in this largely agricultural landscape. Presumably, this condition provided good forage and subnivean shelter, allowing voles to reproduce throughout the winter. Apparently, vole outbreaks can occur simultaneously across a large area. One of the vole/Short-eared Owl irruptions documented by Houston (1997) in 1969 in south central Saskatchewan was also reported in south central Manitoba by Clark (1975). Similarly, in 1997, voles and Short-eared Owls were very abundant near Hanna in Alberta (K. Clayton, unpubl. data) and near Regina in Saskatchewan (Poulin et al., in prep.). In that same year, high vole populations and unusually high numbers of breeding Short-eared Owls were recorded throughout the Aspen Parkland and southern Boreal Mixed-wood Ecozones of Alberta (G. Court, pers. comm.).

3. Pesticides. - Raptors that eat herbivorous mammals usually accumulate low levels of organochlorine residues (Holt and Leasure 1993). Although Short-eared Owls have not been extensively studied for pesticide contamination, detrimental concentrations have not been documented in North America (Keith and Gruchy 1972, Peakall and Kemp 1980, Henny et al. 1984).

STATUS DESIGNATIONS

1. Alberta. - In 1991, the Short-eared Owl was on Alberta's 'Green List' of species not believed to be at risk in the province (Alberta Fish and Wildlife 1991). The species was moved to the 'Blue List' of species that may be at risk in the province in 1996 because of concern over declines in numbers in the prairie provinces and other parts of North America (Alberta Wildlife Management Division 1996). The Alberta Natural Heritage Information Centre has assigned a rank of S3 to breeding Short-eared Owls and S2 to non-breeding (presumably wintering) owls (ANHIC 1999; see Appendix 1 for explanation of ranks).

2. Other Areas. - The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists the Short-eared Owl as 'vulnerable' (Cadman and Page 1994, COSEWIC 1999). This owl is not recognized as a species of special concern by any federal U.S. agency (Johnsgard 1988). In the northeastern United States, Short-eared Owls are listed as 'endangered', 'threatened', or 'of special concern' in Connecticut, Massachusetts, Maryland, New Jersey, New York, Pennsylvania, and Vermont (Tate 1992, Holt and Leasure 1993). Melvin et al. (1989) considered them to be the "rarest and most threatened species of owl" in the northeastern United States. Short-eared Owls were on the National Audobon's Society 'Blue List' of declining birds from 1976 until 1986, when the list was discontinued.

According to The Nature Conservancy's Natural Heritage criteria (The Nature Conservancy 2000) the Short-eared Owl is globally ranked as G5.

Sub-national ranks in the western states and provinces range from S2 to S4 whereas in the northeastern states, most ranks are S1 or S2 (The Nature Conservancy 2000).

RECENT MANAGEMENT IN ALBERTA

No specific management activities have been reported for Short-eared Owls in Alberta.

SYNTHESIS

Short-eared Owls are highly nomadic and are prone to long migrations based on their response to high densities of small mammals in both breeding and wintering periods. Consequently, range delineation, population monitoring, and habitat suitability assessment in Alberta and other areas is difficult and has not yet been well defined.

There are currently no monitoring, management, or research programs aimed at Short-eared Owls in Alberta. Little information on historic breeding locales and habitat associations has been collected in the province resulting in a lack of understanding of the species' status in the province. The few data available suggest that this species has become less common over the last 30 years. Serious declines in Short-eared Owl populations have occurred in the northeastern United States and Breeding Bird Surveys reveal a long-term decline of this owl across Canada. Better definition of the Short-eared Owl's range in Alberta and a means of population monitoring are needed. Establishing more BBS routes in the province, particularly in the north, could help facilitate these objectives. However, to adequately monitor this highly nomadic species, surveys must be conducted on a much broader scale. An annual review and analysis of BBS results may be the most feasible means of tracking Short-eared Owl populations. Both provincial and regional (i.e., northern Great Plains, and western states and provinces) populations should be evaluated annually.

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APPENDIX 1. Definitions of selected legal and protective designations.

A. Status of Alberta Wildlife colour lists (after Alberta Wildlife Management Division 1996)

Red	Current knowledge suggests that these species are at risk. These species have declined, or are in immediate danger of declining, to nonviable population size
Blue	Current knowledge suggests that these species may be at risk. These species have undergone non-cyclical declines in population or habitat, or reductions in provincial distribution
Yellow	Species that are not currently at risk, but may require special management to address concerns related to naturally low populations, limited provincial distributions, or demographic/life history features that make them vulnerable to human-related changes in the environment
Green	Species not considered to be at risk. Populations are stable and key habitats are generally secure
Undetermined	Species not known to be at risk, but insufficient information is available to determine status

B. Alberta Wildlife Act

Species designated as 'endangered' under the Alberta Wildlife Act include those defined as 'endangered' or 'threatened' by *A Policy for the Management of Threatened Wildlife in Alberta* (Alberta Fish and Wildlife 1985):

Endangered	A species whose present existence in Alberta is in danger of extinction within the next decade
Threatened	A species that is likely to become endangered if the factors causing its vulnerability are not reversed

C. Committee on the Status of Endangered Wildlife in Canada (after COSEWIC 1999)

Extirpated	A species no longer existing in the wild in Canada, but occurring elsewhere
Endangered	A species facing imminent extirpation or extinction
Threatened	A species likely to become endangered if limiting factors are not reversed
Vulnerable	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events
Not at Risk	A species that has been evaluated and found not to be at risk
Indeterminate	A species for which there is insufficient scientific information to support status designation

D. United States Endangered Species Act (after National Research Council 1995)

Endangered	Any species which is in danger of extinction throughout all or a significant portion of its range
Threatened	Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range

E. Natural Heritage Element Rarity Panks (after The Nature Conservancy 2000)

Global or G-rank: Based on the range-wide status of a species.
Sub-national or S-rank: Based on the status of a species in an individual state or province. S-ranks may differ between states or provinces based on the relative abundance of a species in each state or province.

G1 / S1	Critically imperiled because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction
G2 / S2	Imperiled because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range
G3 / S3	Either very rare or local throughout its range, or found locally in a restrcited range (21 to 100 occurrences)
G4 / S4	Apparently secure, though it might be quite rare in parts of its range, especially at the periphery
G5 / S5	Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery

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